The Petroleum Situation

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THE OUTLOOK FOR HEATING OIL

The peak driving season is over for this year. The long lines at gas stations have disappeared, although they may be back again next spring. Attention in the eastern part of the United States is focused on heating oil supplies given the coming winter. To the homeowner, it is just heating oil, the product that keeps him warm. To the refiner it is part of his output of distillate fuels, which are sold for such varied uses as space heating, boiler fuel, stationary diesel engines or in diesel powered vehicles. Volumetrically, distillate fuels are the refiner's second most important product after gasoline and account for between 20 and 25 percent of his total production. In a full product refinery, the flexibility to vary the output of distillate fuels is far less than for gasoline so more advance planning is necessary to meet the wide seasonal fluctuations in the market for distillate fuels.

Of the total quantity of distillate fuels sold in the United States, more than a quarter is diesel oil. Consumption of diesel fuel may vary with changes in economic activity but there is very little seasonal fluctuation. As much is used in summer as in winter. The remaining three-quarters of distillate fuels represents various grades of heating oil, with residential heating oil the dominant product. Consumption of heating oil is, of course, highly seasonal. In the East Coast market, primary demand in the first quarter of the year is about five times as great as in the third quarter. New supplies from domestic and foreign sources cannot be adjusted to cope with such a large variation in demand, with the result that greater reliance has to be placed on oil in storage as a source of supply than is the case with any other petroleum product.

The role of storage, however, should not be overestimated. The federal government's target of 240 million barrels of distillate fuel oil in primary storage by the end of October has received a lot of publicity, and the fact that the oil industry met this goal could lead to the belief that heating oil supplies were assured for the coming winter. While we are certainly not predicting a heating oil shortage at this time, it would be well for consumers to realize the limitations of oil in storage as a source of supply.

Some 60 percent of the total consumption of residential heating oil occurs in the East Coast states from Maine to Florida. For statistical purposes these states are treated as one district although the bulk of the heating oil is, of course, used in the colder states of New England and the Middle Atlantic region. On the supply side, available data does not permit disaggregation of distillate fuel into its diesel fuel and heating oil components, but we have estimated that the diesel fuel portion of distillate use in the East Coast region amounts to a little over half a million barrels a day, and that diesel fuel stocks range from 15 to 20 million barrels.

The table below illustrates the main elements of distillate fuel supply in the East Coast region from November 1978 through April 1979, the six months when heating is most important in the Northeastern part of the nation.

East Coast Distillate Supply
(Thous. Bbls. Daily)

	Nov.'78-Apr. '79
Local Refineries	415
Foreign Imports	193
From Gulf Coast Region	866
From Great Lakes Region	9
New Supply	1483
From Storage	337
Total Supply	1820

Slightly under a quarter of the total supply came from refineries located within the East Coast region and almost half came from refineries situated on the Gulf of Mexico. This situation has existed for many years. In the days when oil supplies were ample, East Coast states felt no necessity to build refineries within their own boundaries although the oil industry made numerous attempts to do so. Now that oil supplies are less secure these same states are still forced to look to other regions for the bulk of their distillate fuel needs.

As might be expected, over 90 percent of the imports of foreign distillate fuel coming into the United States are delivered to East Coast terminals, where last winter they accounted for 11 percent of total supply in the region.

Oil from storage is the remaining source of supply. Distillate stocks were built up during the summer of 1978 and by the end of October amounted to 105 million barrels. Between the end of October 1978 and the end of April 1979, about 61 million barrels were moved out of storage and into consumption channels. Over the six months under review, stocks contributed an average of 337 thousand barrels a day to the supply stream, 11 percent of the total from all sources.

Of the 44 million barrels of distillate fuel remaining in storage at the end of April 1979, a substantial portion was not available for distribution during the preceding winter. Almost 6 million barrels represented oil in pipelines which would not be delivered to terminals until it was displaced by new supplies of products going into the pipeline. Another 6 million barrels was stored in refinery tanks, but this was not all available either. About half probably consisted of tank bottoms which due to contamination could not meet customers' specifications. The same quality problem affected a portion of the 32 million barrels stored at terminals around the region. And then, in addition, between a third and a half of the distillate stocks that could be moved represented diesel fuel and was not available to home heating oil dealers. In other words, the complex distribution network requires a substantial quantity of unavailable stocks of various grades in order to function with adequate flexibility.

The disposition of the East Coast supply of distillate fuel is shown in the following table. About 50 thousand barrels a day of supplies from the western part of the region move to customers in adjacent states in the Great Lakes area. The balance was divided between diesel fuel outlets and home heating oil dealers.

Nov.'78-Apr. '79 Disposition of East Coast Distillate Supply
(Thous. Bbls. Daily)

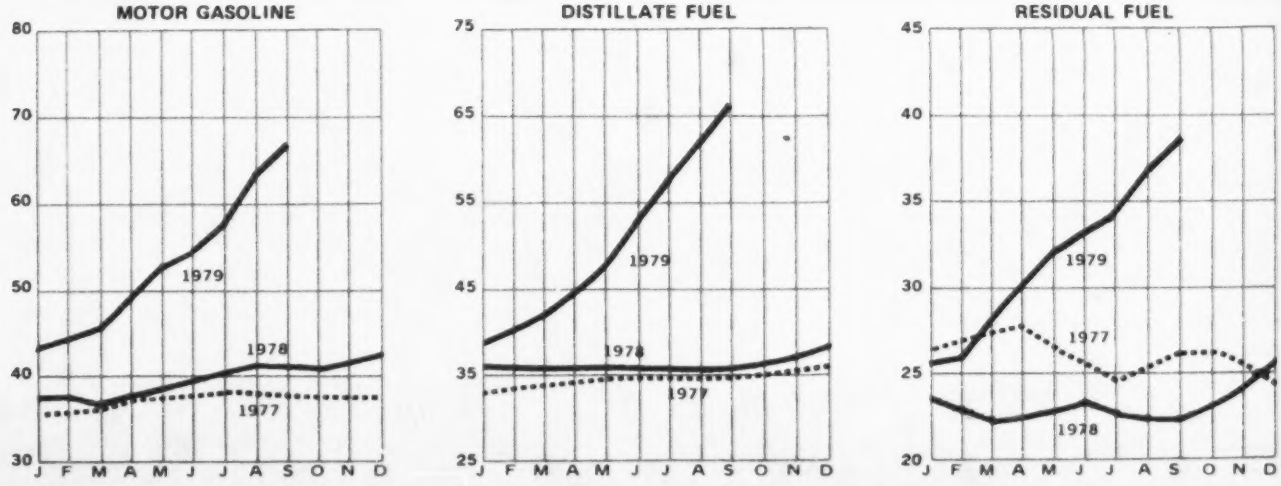
Great Lakes area	50
Diesel Fuel	525
Heating Oil	1245
Total	1820

Last winter's pattern of supply and disposition of distillate fuel along the Eastern seaboard should be considered fairly typical. None of the supply elements could be increased substantially from one year to the next, although all of them could be severely affected by another world oil shortage. On the demand side, heating oil consumption was influenced by a weather factor that, based on degree days, was 2.7 percent warmer than normal.

What do these numbers tell us about the outlook for the coming winter, or more specifically for the period from November 1979 to April 1980? First, if temperatures are normal, then consumption of heating oil should be slightly higher than last year, although the effects of somewhat colder weather may well be offset by price-induced conservation and switching to natural gas. Next, demand for diesel fuel is expected to continue growing. Due to the greater efficiency of diesel engines, higher prices increase the relative attractiveness of diesel compared with gasoline, but this consideration, too, may be modified by the recession and the resultant drop in the quantity of goods required to be transported. After weighing the pros and cons, we believe that this winter's demand for distillate fuel in the East Coast region will in all likelihood be no higher than last winter. It could therefore be met by a supply pattern similar to the one shown in the table presented earlier. Stocks of distillate fuel at the end of September were more than 10 million barrels higher than a year earlier, so the amount of supply available from stock withdrawals will be as high as last year. New supply from local refineries and shipments from other parts of the country should present no special problems in the absence of a major crude oil import dislocation such as would arise from another shutdown of the Iranian oil industry. Even that could be largely offset, as it was a year ago, by drawing more heavily on crude oil stocks to maintain refinery output at close to normal levels.

Our conclusion, therefore, is that adequate supplies of heating oil will be available to the Northeastern states this winter, though not at prices that people will be happy to pay. For the average homeowner, with a 275

U.S. Wholesale Prices . . .
BY MONTHS
cents per gallon



gallon tank, there will be several months during the current heating season when he will pay more than $500 a month to keep warm. If the government proposes to subsidize the poor, an appropriate plan will need to be implemented promptly. In our view, the simplest solution would be to issue "oil stamps" to those people currently receiving food stamps. The mechanism is already in place and a new bureaucracy need not be created to administer the plan.

John D. Emerson

UNITED STATES PETROLEUM HIGHLIGHTS

DEMAND

Only jet fuels and some of the minor products posted gains in demand in September over year-ago levels. The major products were all lower, and total domestic deliveries into consumption channels were almost half a million barrels a day below the level of September 1978. They were even slightly below the level of two years ago.

Thus far in 1979, only in January and February was the demand for petroleum products higher than a year earlier. The average for the first nine months of 1979 shows a reduction in primary demand of 1.3 percent. In part, this is a reflection of the sharp increase in prices. This has manifested itself in greater conservation efforts and in switching from petroleum products to natural gas and, to some extent, to coal. The slower growth of economic activity has been another contributory factor. In view of the unsettled outlook for foreign crude oil supplies, further switching away from petroleum products can be expected.

We have been predicting for some time that higher gasoline prices and the downsizing and lower gasoline consumption of new cars would halt the growth in total gasoline use, and this appears to have occurred. For six consecutive months, gasoline consumption has been below year-earlier levels. In the past three months, the decline amounted to over half a million barrels a day. The proportion of vehicles requiring unleaded gasoline is still growing, of course, and unleaded fuel now represents 40 percent of the total compared to 35 percent a year ago.

SUPPLY

September saw crude oil production drop by over a quarter of a million barrels a day to the lowest level of any month in 1979. Two severe hurricanes were the cause, and offshore Louisiana bore the brunt of the reduction. Other crude producing regions showed little change in output from August.

Imports, too, were lower in September, falling by 600 thousand barrels a day from the unusually high August level. Slightly over half of the reduction reflected lower receipts of crude oil, with the balance divided between residual fuel and minor products. The reduced availability of new crude oil supplies led to a decline in refinery operations from 84.8 percent of capacity in August to 82.6 percent in September. The yield of distillate fuel was increased again as refiners sought to meet the government's inventory target.

STOCKS

Stocks of all oils at the end of September were slightly ahead of the year-earlier level. The buildup in September averaged 713 thousand barrels a day for all oils, but distillate stocks alone rose by more than a million barrels a day, reaching 229 million barrels by the end of the month. The buildup of fuel oil stocks was partially offset by continued withdrawals from storage of gasoline, jet fuel and minor products.

Crude oil stocks fell by 2 million barrels during September, but at month-end they were still at the level of a year earlier.

PRICES

Yet another category of crude oil has been added by the Department of Energy Entitlement Office. The latest is heavy oil produced mainly in California. Quantities are small at present, about 50 thousand barrels a day, but this oil has now been freed from price controls. One of the impediments to increased production has thus been removed. Heavy oil is produced by steam injection which lowers the viscosity to the point where the oil will flow. There are some environmental problems connected with the boilers that produce the steam which may slow down the development of this source of energy, and there is the further problem that not many West Coast refineries are equipped to handle heavy oil.

TABLE 1

REFINER ACQUISITION COST OF CRUDE OIL

	Price $/BBL	Percent Share of Total Crude	Price $/BBL	Percent Share of Total Crude
CLASS	AUGUST 1979		AUGUST 1978	
Lower Tier	6.58	13.0	5.98	18.3
Upper Tier	13.86	18.6	12.71	18.3
Alaska	21.38	7.5	12.90	7.8
Stripper	25.07	10.4	14.44	7.4
NPR	21.16	0.7	13.51	0.6
Newly Discovered	28.81	0.7	–	–
Heavy Oil	16.90	0.4	–	–
Tertiary	16.74	0.0	–	–
Domestic Composite	15.73	51.3	10.64	52.4
Imported	23.98	48.7	14.46	47.6
Composite	**19.75**	**100.0**	**12.46**	**100.0**
"Entitlements" Penalty	.10	–	.05	–
Refiner Acquisition Cost	19.85	–	12.51	–

Sources: U.S. Department of Energy
Chase Manhattan Bank

The refiner acquisition cost of crude oil continued to mount in August. The composite of domestic prices increased by 99 cents a barrel from the July level, and imported crude was 91 cents a barrel higher, the smallest month-to-month increase for imported crude oil since March. Over the past twelve months, the composition of the U.S. supply of crude oil has changed, as shown in Table 1. The two categories still under price controls, upper and lower tiers, have dropped from 36.6 percent of total supply to 31.6 percent. Oil has moved out of the lower tier category into stripper and upper tier. And some oil previously classified as upper tier has shifted to the newly created categories.

Since August 1978, lower and upper tier crude oils have risen in price by 10 percent and 9 percent, respectively. The other categories, not subject to price controls, have tracked the rapid increase in world prices with the result that the domestic composite price rose by 48 percent. The cost of imported oil rose still faster, 66 percent between August 1978 and August 1979. Over this period of time, the composite price to refiners of all crude oils showed an increase of 59 percent or 17.5 cents a gallon, while the average wholesale price of refined products, based on our Type 1 refinery allocation, rose by 21.8 cents a gallon.

TABLE 2

AVERAGE WHOLESALE PRICES FOR PETROLEUM PRODUCTS

(Cents/Gallon)

	1979 SEPT.	1979 AUG.	1979 JULY	1978 SEPT.
Motor Gasoline	66.8	61.7	57.8	40.6
Kerosine	67.8	63.6	59.4	36.9
Distillate Fuel	66.0	61.7	57.1	35.4
Residual Fuel	38.0	36.6	34.1	22.2

Source: Independent Petroleum Association of America

TABLE 3

SPREAD BETWEEN GROSS REVENUE AND CRUDE OIL COST

($/Barrel)

	Type 1 Refinery	Type 2 Refinery
1975	1.21	0.10
1976	2.01	0.31
1977	2.49	0.94
1978	2.39	0.10
May 1979	4.23	1.46
June 1979	4.00	0.97
July 1979	3.87	0.40
Aug. 1979	4.34	0.65

Note: Spread figures are calculated as follows:

	Motor Gasoline	Kerosine	Distillate Fuel	Residual Fuel
Type 1	50%	8%	25%	17%
Type 2	21%	8%	19%	52%

Wholesale prices of refined products rose again in September, with gasoline registering an increase of 5.1 cents a gallon. The average of the four major products increased by 4.2 cents a gallon, slightly more than the 3.9 cents a gallon rise in August.

	SEPTEMBER 1979	SEPTEMBER 1978	Change %	3 MOS. AVERAGE 1979	3 MOS. AVERAGE 1978	Change %	YEAR TO DATE AVERAGE 1979	YEAR TO DATE AVERAGE 1978	Change %
	Thous. Bbls. Daily			Thous. Bbls. Daily			Thous. Bbls. Daily		
Primary Demand									
Gasoline	7,033	7,406	- 5.0	7,045	7,621	- 7.6	7,105	7,396	- 3.9
(Unleaded) •	(2,853)	(2,630)	(8.5)	(2,865)	(2,713)	(5.6)	(2,802)	(2,489)	(12.6)
Jet Fuel	1,122	1,078	4.1	1,127	1,072	5.1	1,081	1,053	2.7
Kerosine	132	174	- 24.1	136	126	7.9	186	167	11.4
Distillate Fuel	2,461	2,653	- 7.2	2,577	2,649	- 2.7	3,259	3,354	- 2.8
Residual Fuel	2,441	2,714	- 10.1	2,464	2,812	- 12.4	2,804	3,072	- 8.7
All Other	4,315	3,925	9.9	4,171	3,795	9.9	4,037	3,679	9.7
Total Domestic Demand	17,504	17,950	- 2.5	17,520	18,075	- 3.1	18,472	18,721	- 1.3
Exports	447	477	- 6.3	449	403	11.4	465	333	39.6
Total Demand	17,951	18,427	- 2.6	17,969	18,478	- 2.8	18,937	19,054	- 0.6
New Supply									
Domestic	10,598	10,915	- 2.9	10,689	10,927	- 2.2	10,697	10,802	- 1.0
Crude Oil	8,354	8,787	- 4.9	8,534	8,774	- 2.7	8,524	8,689	- 1.9
Natural Gas Liquids	1,677	1,546	8.5	1,685	1,554	8.4	1,701	1,567	8.6
Other Supply	567	582	- 2.6	470	599	- 21.5	472	546	- 13.6
Imports	8,066	8,703	- 7.3	8,320	8,214	1.3	8,250	7,932	4.0
Crude Oil	6,404	6,720	- 4.7	6,558	6,287	4.3	6,357	5,935	7.1
Refined Products	1,662	1,983	- 16.2	1,762	1,927	- 8.6	1,893	1,997	- 5.2
Residual Fuel	1,027	1,315	- 21.9	1,023	1,291	- 20.8	1,154	1,365	- 15.5
All Other	635	668	- 4.9	739	636	16.2	739	632	16.9
Total New Supply	18,664	19,618	- 4.9	19,009	19,141	- 0.7	18,947	18,734	1.1
Crude Oil Refined	14,523	15,076	- 3.7	14,816	15,052	- 1.6	14,526	14,555	- 0.2
Stock Change	713	1,191	–	1,040	663	–	10	–320	–
Stocks – End of Month in Million Barrels									
Gasoline	228	217	5.1						
Jet Fuel	33	35	- 5.7						
Kerosine	16	16	–						
Distillate Fuel	229	221	3.6						
Residual Fuel	92	81	13.6						
All Other	299	325	- 8.0						
Total Products	897	895	0.2						
Crude Oil	321	321	–						
Total – All Oils	1,218	1,216	0.2						

Totals may not add due to rounding
• Included in gasoline

Sources: *American Petroleum Institute*
Chase Manhattan Bank
Department of Energy